



## General Capabilities

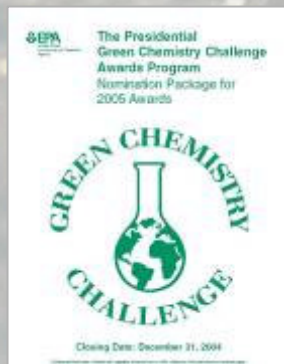
*Benjamin M. Locke*

*Director of Government Programs*



# Metabolix Vision

“ By combining bioscience  
and nature we bring a clean solution  
to the world with *Natural Plastic* ”



2005  
Presidential  
Green  
Chemistry  
Award





# History

- **Company formed in 1992; MIT spin-out**
- **Became a public company in November 2006:  
NASDAQ - MBLX**
- **60 employees, multifunctional team**
  - Experienced management team
  - Strong bioscience base
  - Process & product development and commercialization
  - Sales, marketing and branding

# Metabolix – Integrated Bioscience Creating Commercial Opportunities



**Metabolix  
Integrated  
Science  
Capabilities**

- **JV with ADM**
  - Commercialization of natural plastics via fermentation
- **Tepha**
  - Spin out, exclusive license for biomedical applications
- *Natural plastic production in switchgrass*
- *Biomass biorefinery opportunities*
- *Biobased chemical intermediates*



# Brand Overview

- **Now commercializing best-in-class branded *Natural Plastic***
  - Outstanding properties; made from corn
  - The only biobased, sustainable and totally biodegradable plastic
  - Reduced greenhouse gas emissions vs. petroleum based plastics
- **Strong partnership with ADM**
  - One of the world's largest agribusinesses
  - Globally develop and deliver *Natural Plastic* to the world
- **Breakthrough technology is strongly patent protected**
  - Over 320 patents issued worldwide
  - Patents covering both product and process
- **Experienced management team in place**
  - Innovative award winning R&D
  - Process & product development and commercialization
  - Global sales, marketing and branding

# Petroleum-Based Plastics Have a Big Problem



**Petroleum  
Supply**



**Climate  
Change**

**Petroleum-based  
plastics create  
energy and  
waste issues**



**Energy  
Security**

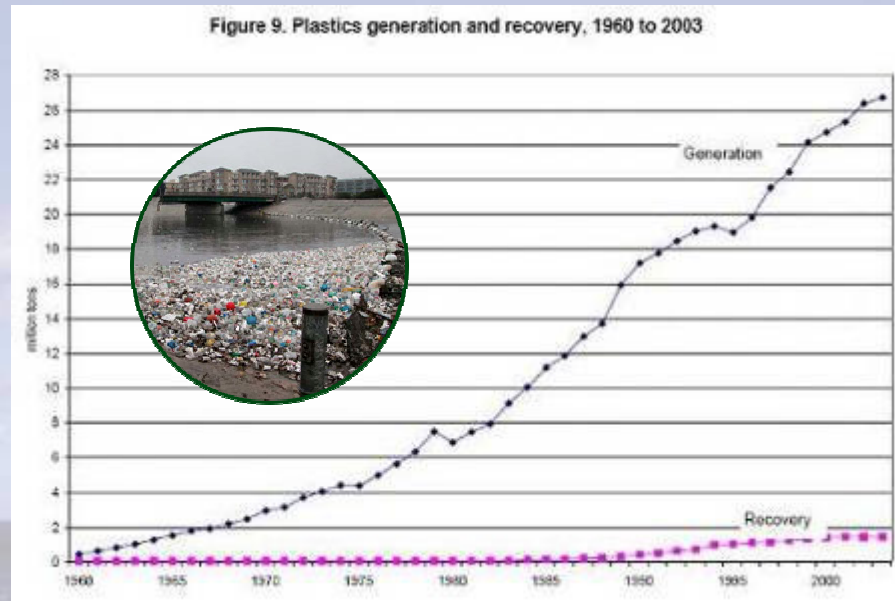


**Waste  
Management  
& Pollution**

**Plastics Comprise ~9% of  
U.S. Petroleum Consumption**

# Recycling is a Partial Solution

- A truly clean environment requires multiple solutions



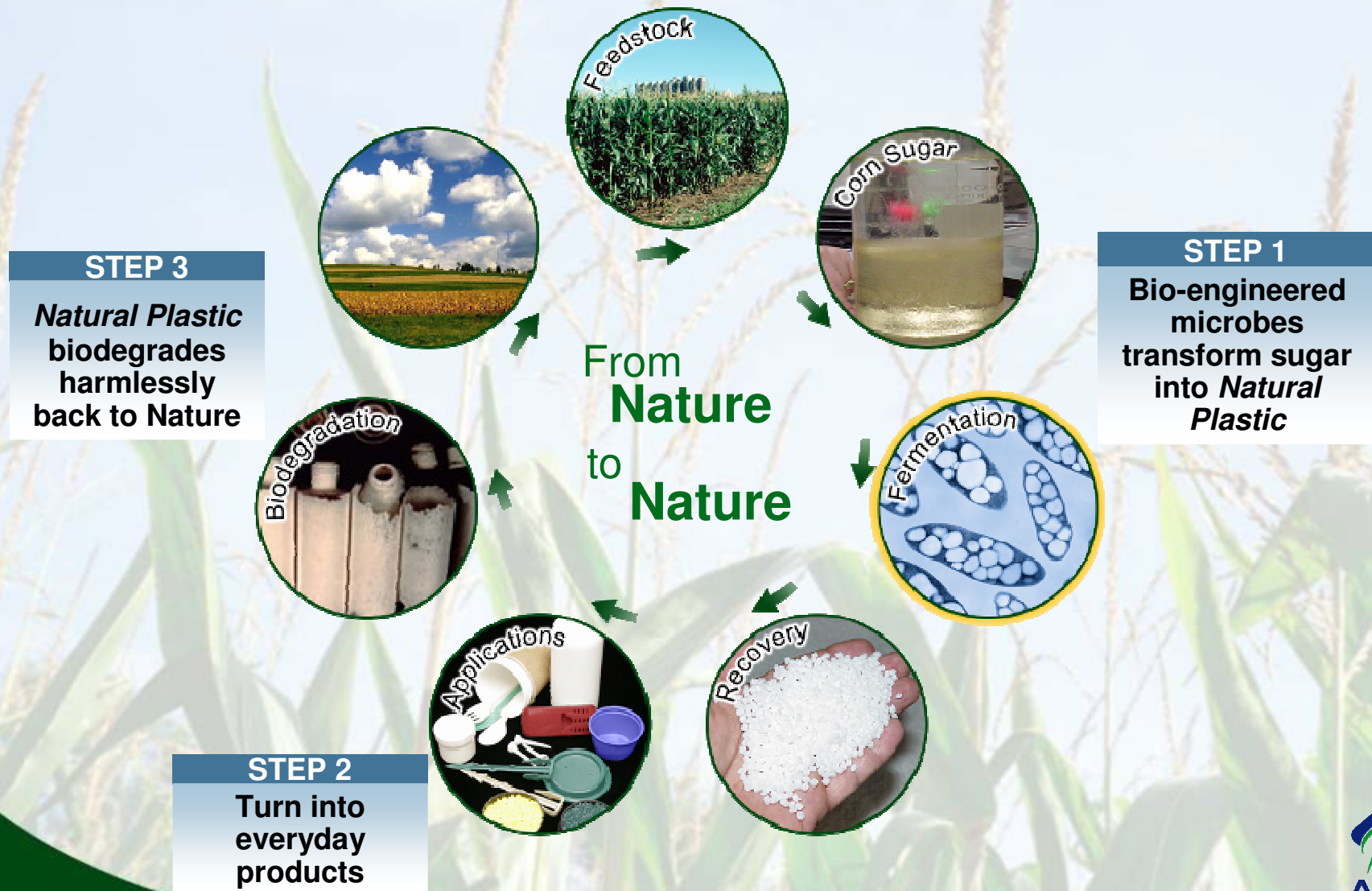
## Conventional Plastics... Are Forever

- US recycling recovers less than 6%
- European recycling recovers 18%\*

\*Plasticseurope.org 2006



# The Metabolix Solution





# Metabolix *Natural Plastic* Is the Greenest and Cleanest in the World



*Natural Plastic... is Biodegradable*

## The Greenest

*Natural Plastic* is from Nature and biodegrades back to Nature in all these environments

- Industrial and home composting
- Soil
- Municipal waste treatment facilities, septic systems
- *Even wetlands, streams, and oceans*

# Metabolix *Natural Plastic* Is the Greenest and Cleanest in the World



## The Cleanest

- It's made from corn sugar
- We use corn stalks to produce energy for our plant
- We supplement that with wind or solar power
- **We reduce petroleum usage by 80% and greenhouse gas emissions by 66%**

# “Clean and Green” is a Major Trend with Many Brands Leading the Way

Increasing  
Social  
Pressures

Environmental  
Concerns

Rising Cost  
of Fuel

Changing  
Regulations

Demand for  
Corporate  
Change

**METABOLIX**  
where nature performs™

Enhancing  
marketability  
of products



**TOYOTA**

**WAL★MART**



**WHOLE  
FOODS  
MARKET**



invent

**L'ORÉAL**







# Metabolix *Natural Plastic* Serves Broad Applications

2005 U.S. Plastics Division of Product Share:

- ✓ 29% Packaging
- ✓ 21% Consumer & Institutional
- ✓ 19% Building & Construction
- ✓ 17% Exports & All Others
- ✓ 6% Transportation
- ✓ 4% Electrical/Electronic
- ✓ 4% Furniture/Furnishings

Source: American Plastics Council 2005





12

# Metabolix *Natural Plastic* Serves Broad Applications

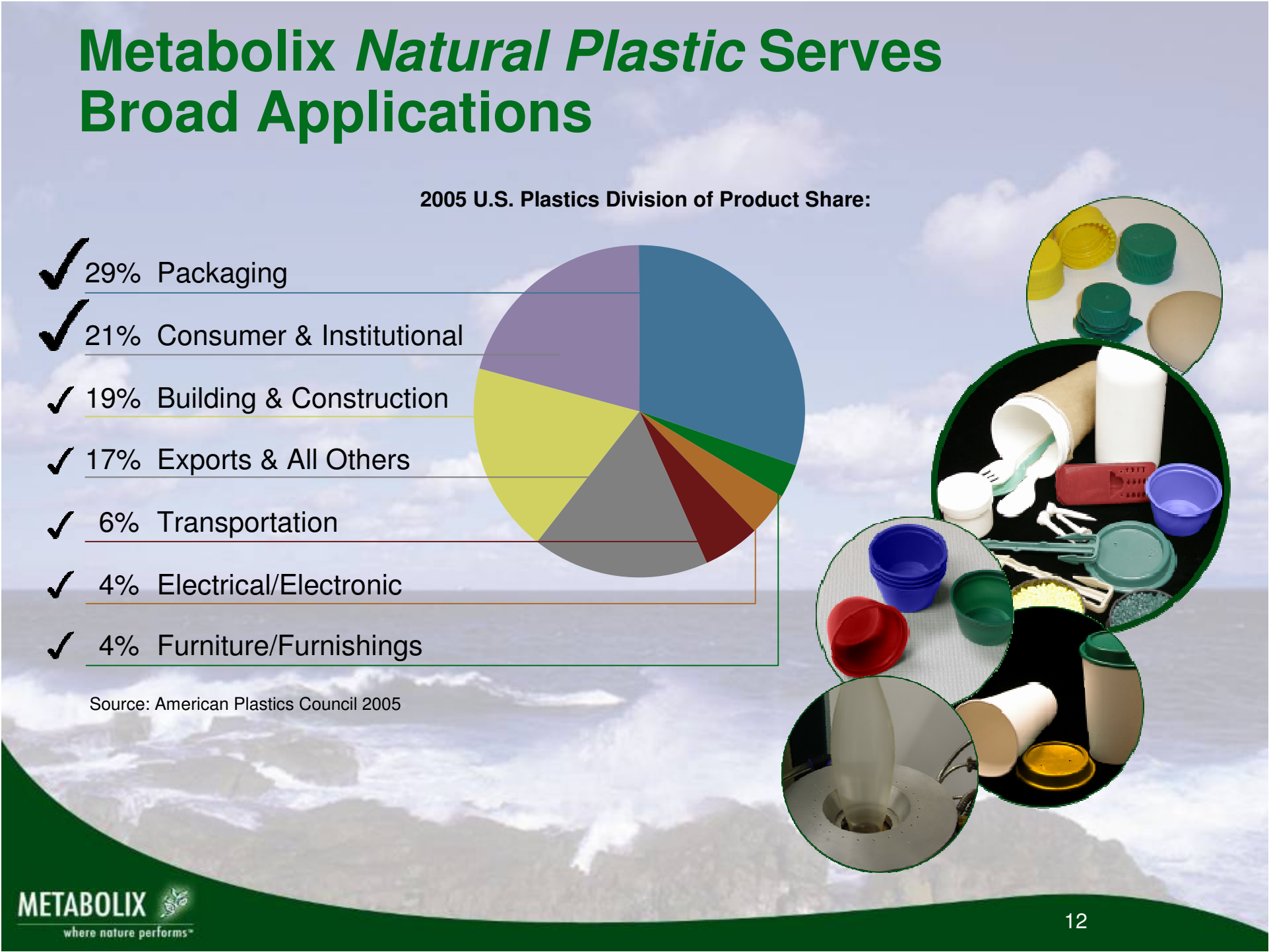
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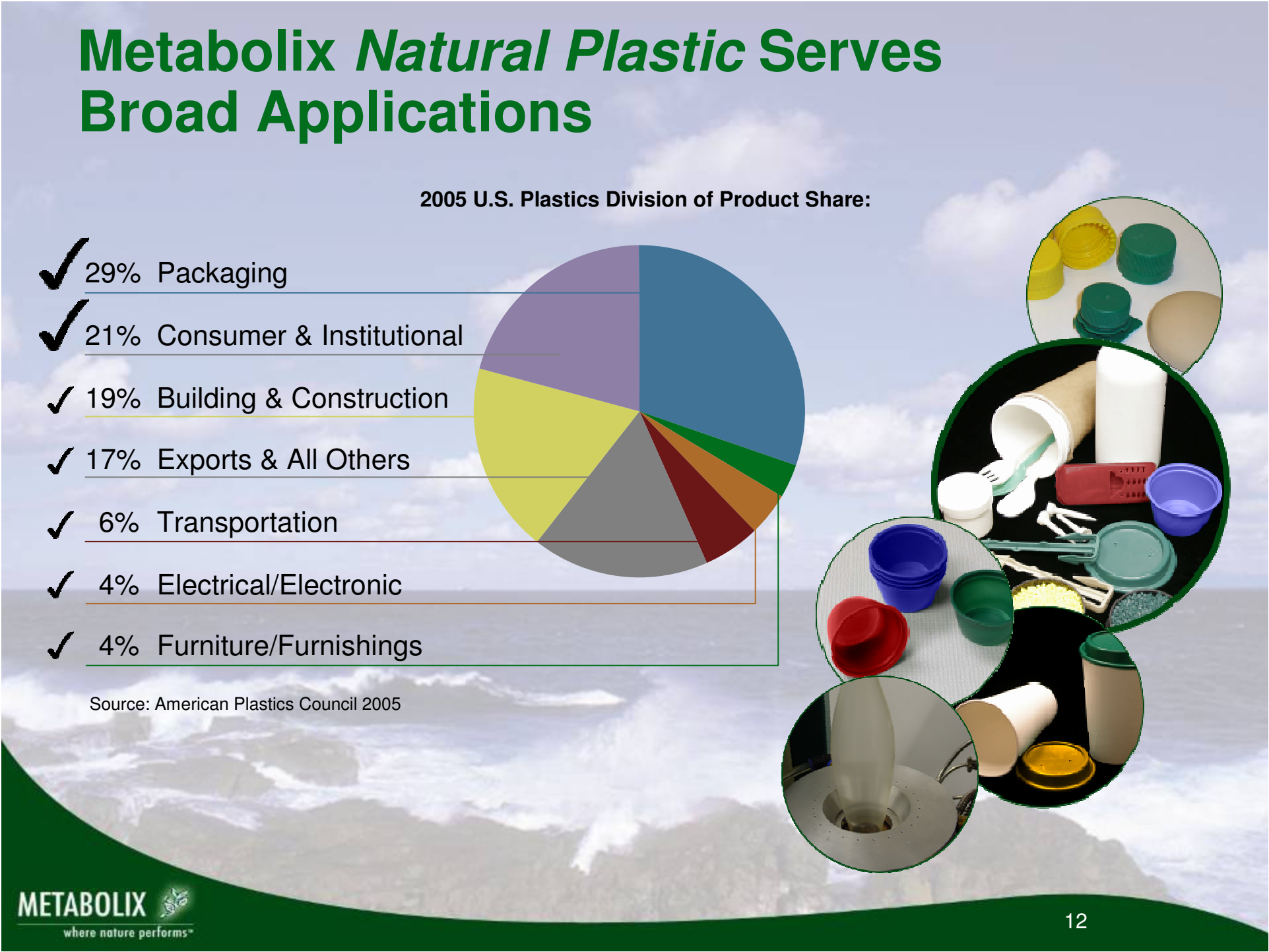
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12



# Product Applications

Potential customers are evaluating over 50 different applications

## Single Use Disposables

- Hot cups
- Lids
- Dinnerware
- Single serve coffee packs
- Utensils

## Agriculture & Erosion Control

- Degradable erosion control netting
- Degradable mulch films and pots
- Degradable stakes

## Electronics

- Cell phone housings
- Trays

## Packaging

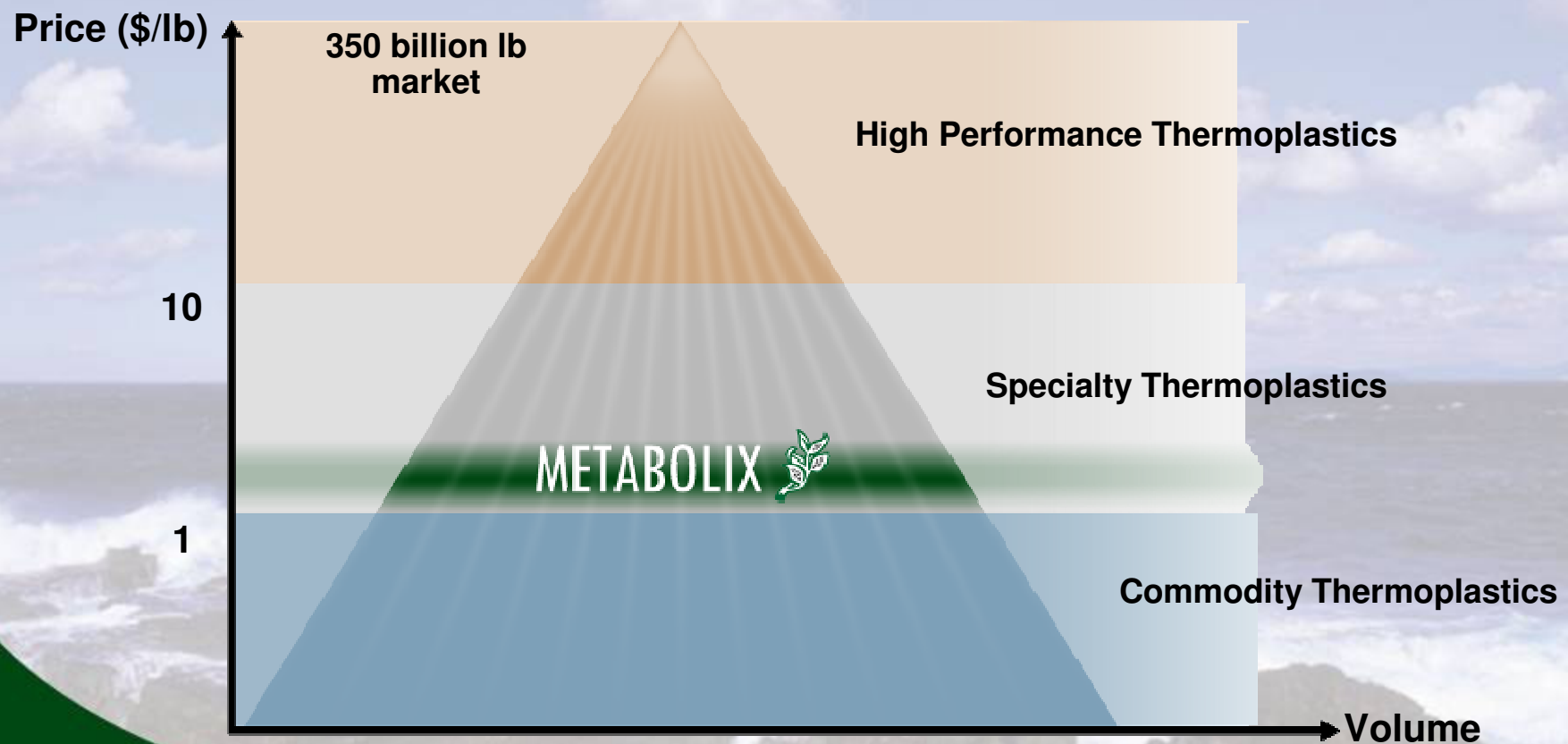
- Caps and closures
- Food wrap
- Detergent sachets
- Food containers
- Cosmetics cases
- Stretch wrap
- Bags
- Foam
- Beverage cartons

## Consumer Products

- Personal hygiene products
- Flushable household products

# Targeted Marketing Strategy

- Environmentally superior but functionally equivalent to petrochemical plastics





# Branding The Product

**Metabolix *Natural Plastic***

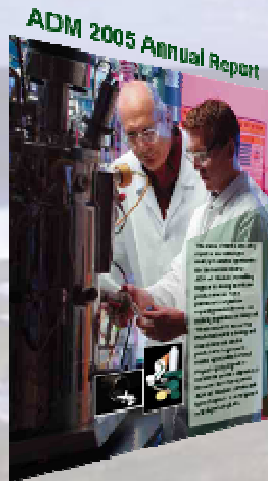
*Environmental  
Responsibility*

**Consumers  
Brand Owners  
Converters**

- Utilizing Metabolix *Natural Plastic* is a major selling point!
- We will co-brand with other premium brands
- Establish awareness and market the brand globally

# ADM/Metabolix Strategic Alliance

- Strategic alliance with ADM
  - Plant construction now underway



ADM and Metabolix are working together to develop products... that can replace petroleum-based plastics while expanding markets for crops and reducing dependence on foreign oil...

# ADM's Clinton, Iowa Facility



- Building 110 million lb/year commercial plant
- 2<sup>nd</sup> half 2008 start-up





# Competitive Landscape

## Biodegradable



## Based on Petroleum

Synthetic biodegradable

BASF  
DuPont  
Showa Denka  
Mitsubishi Chem

## Based on Renewable Resource

**METABOLIX**   
where nature performs™

PLA  
Cargill – Natureworks

Starch Based  
Novamont – Mater-Bi

## Non-Biodegradable



## Conventional Plastic Materials




DuPont Sorona (~30% biobased)

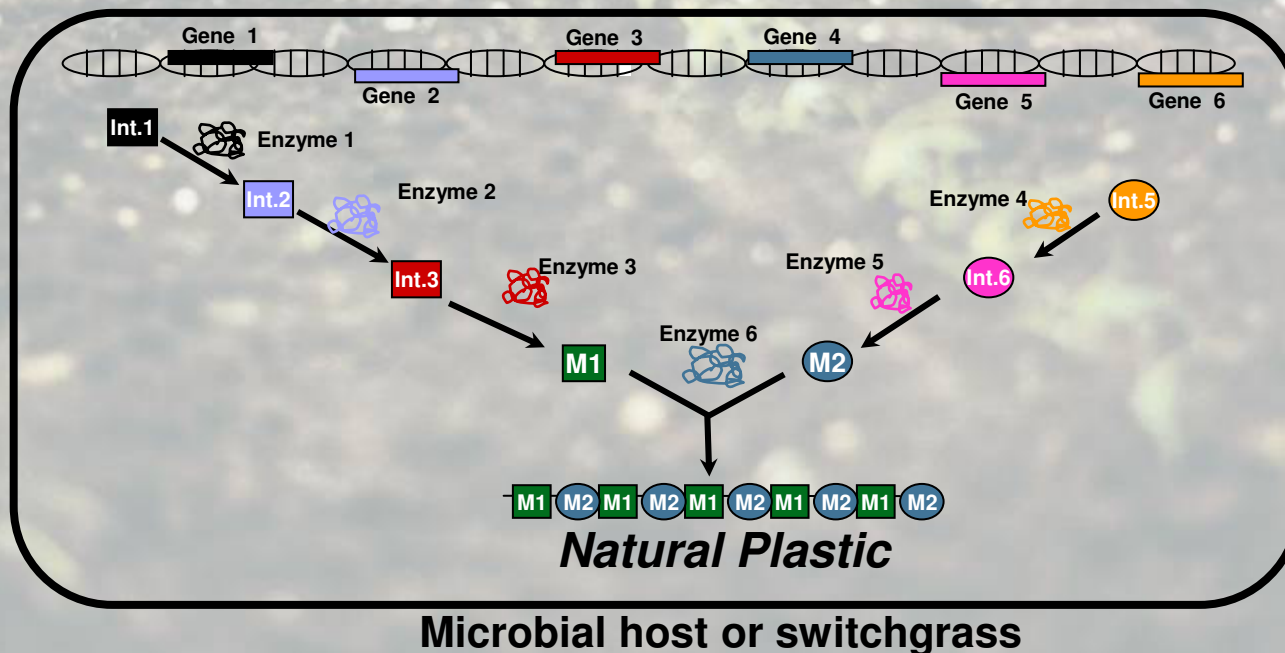
Dow - Soybean polyol  
polyurethanes



# Metabolix Core Bioscience Capabilities

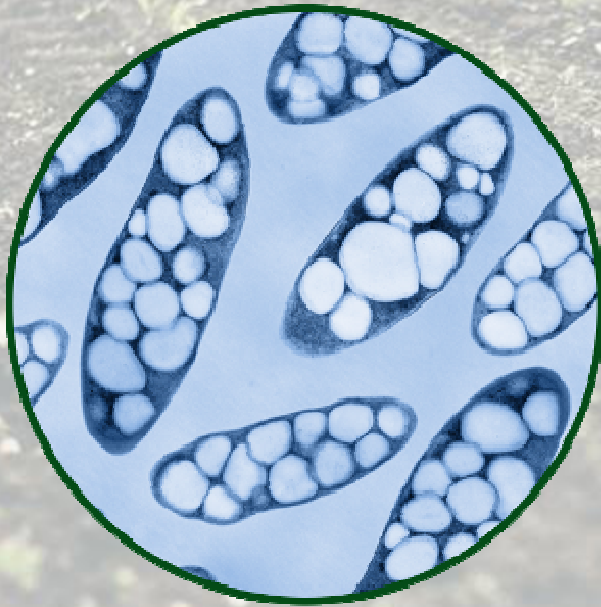
## Metabolic Pathway Engineering at the Genome Level

- Metabolic pathway modeling
- Access nature's diverse biocatalytic capabilities encoded by specific genes > 
- Precision genome engineering – microbes or plants





# Pathway Engineering at Genome Level



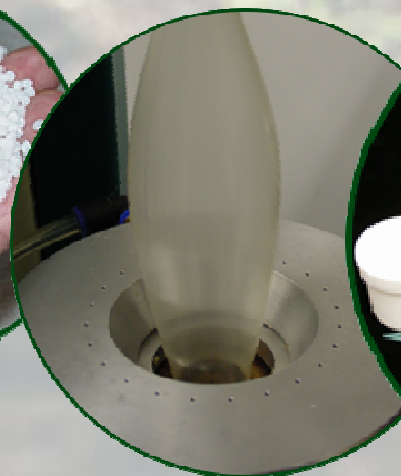
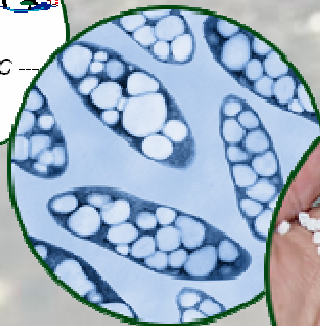
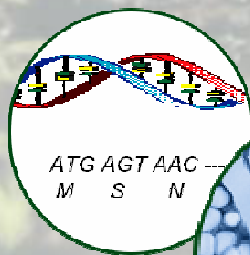
**Microbes Reach >80%  
*Natural Plastic* by Weight**

- Fully developed technology
- Demonstrated at industrial scale
- Produces the range of materials required for commercialization



# Metabolix - Broad and Deep Patent Coverage

- Own over 320 issued patents and 100 patent applications world wide
- Licensed an additional 60 issued patents and 32 patent applications world wide



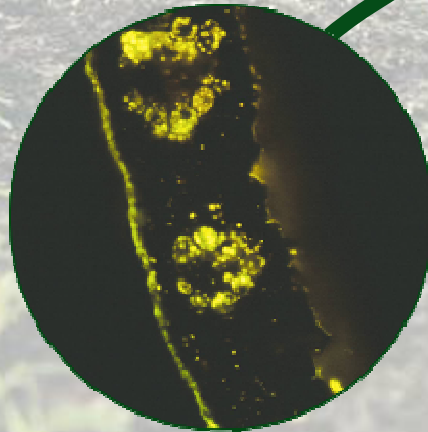
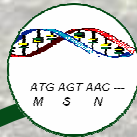
## Additional Opportunities

- Natural Plastics in Partnership with ADM ✓
- Switchgrass Technology for Plastics and Fuels
- Renewable **biobased** large volume chemicals



# From Plants to Plastic and Fuels

Genetic Transformation



*Natural Plastic*  
Inside Plant Leaf



Platform extension:  
*Switchgrass transformation enables enhanced biomass for fuels*

Biorefinery



Potential uses:  
Biofuels

Electric power, heat

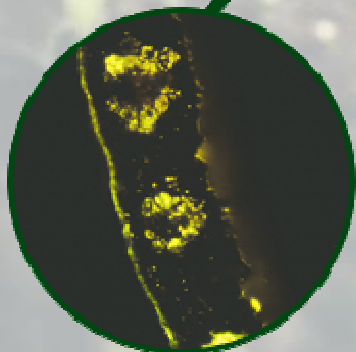
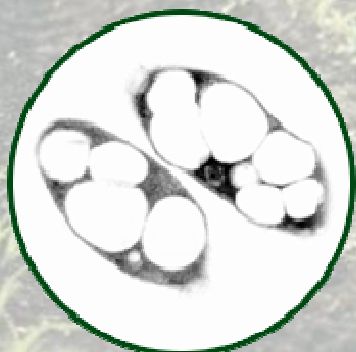
US Switchgrass Case

<i>Natural Plastic</i>	~ 30 billion lbs / year
CO <sub>2</sub> Reduction	~ 200 million tons / year
Energy Savings	~ 1 million bbls of oil / day



# Platform Extensions

## Large Volume Chemical Opportunities



- 1,4-Butanediol
- Tetrahydrofuran (THF)
- N-Methyl Pyrrolidone (NMP)
- N-Vinyl Pyrrolidone
- Acrylic Acid
- Acrylamide
- 1, 3 – Propanediol

Replace petroleum based chemicals with **biobased** chemicals

# Metabolix *Natural Plastic* Highlights

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**THE FUTURE IS**  
***“NATURAL PLASTIC”***  
**METABOLIX**